

Amendments to the Drawings:

The attached sheets of drawings include changes to the margins in compliance with 37 CFR 1.84(g).

Attachment: Replacement Sheets 1-5

REMARKS/ARGUMENTS

Nine claims were originally filed in the specification, including four independent claims. Claims 1, 4, 5 and 6 have been amended. Claims 3, 7, 8 and 9 have been cancelled without prejudice. New claims 10-16 have been added. Twelve claims remain in the application, including four independent claims. No claim fees are believed due.

Claims 1 and 6 have been amended to further provide that the laser bore of the nozzle have an access opening in fluid communication with the flow passage, and to further provide a removable plug to seal the access opening during the machining operation. Support is found at paragraph 0034.

Claim 4 has been amended to provide that the surface of the distal end of the removable plug have the shape of the inner surface of the flow passage prior to forming the laser bore. Support is found in the claim as originally filed.

Claim 5 is amended, and new claims 10 and 13 are added, to provide that the machining interface have an atypical interface profile, and that the coolant nozzle having a flow passage configured to emit a stream having an atypical cross-sectional profile substantially the same as the atypical interface profile; and to provide that the laser bore penetrates through the nozzle and forming an outlet opening in a front portion of the nozzle proximate the coolant outlet. Support is found at paragraph 0028 and Fig. 1.

New Claim 14 provides a method for cooling a machined workpiece using the laser-targeted coolant nozzle. Support is found at paragraph 0038.

New Claims 11, 13 and 16 provide a machining reference point and a stream reference point, for aligning the visible laser beam to position the nozzle. Support is found in original Claim 2.

Applicants assert that no new matter has been added.

A. The drawings are objected to under 37 CFR 1.84(g)

The Examiner objected to the drawings for Figs. 1-6 because the margins are not acceptable.

Corrected drawings sheets 1 through 5 are enclosed.

B. The abstract is objected to.

The Examiner objected to the Abstract because of length.

An amended Abstract has been provided.

C. Claims are rejected under 35 USC 112.

The Examiner rejected Claims 1-4 and 6-8 under 35 USC 1123, second paragraph, as being indefinite for failing to particularly point out and distinctly claims the subject matter which applicant regards as the invention.

Applicants have amended Claims 1 and 6 to further provide a removable plug insertable into the access opening, after the laser is removed, to seal the access opening while the emitted stream of cooling liquid is directed at the machining interface.

Applicants have also amended Claim 4 to provide that the surface of the distal end of the removable plug has the shape of the inner surface of the flow passage prior to forming the laser bore.

Applicants believe these amends fully address the Examiner's objections to the claims.

D. Claims are rejected under 35 USC 102

The Examiner rejects Claim 9 under 35 USC 102(b) as being anticipated by anyone of Kuykendal (5,773,791), Goldsmith et al (5,759,031), Klein II et al (5,598,972) or Bramwell et al. (4,444,495).

Applicants have cancelled Claim 9 without prejudice, rendering this rejection as moot.

The Examiner rejects Claims 5 and 9 under 35 USC 102(e) as being anticipated by Webster (6,669,118).

Applicants have cancelled Claim 9 without prejudice, rendering this rejection as moot relative to Claim 9.

Applicants traverse the rejection of Claim 5. Webster discloses a nozzle assembly having one or more coherent jet nozzles for transmitting fluid through a modular front plate, to direct the fluid to a grinding wheel. The only relevant description is found at Col.7 lines 5-8:

“Advantageously, a laser pointer or other suitable pointing device may be projected from the plate 38’ towards the profile of the grinding wheel to identify which of the holes 42 are to be selected for a given grinding operation.”

Webster appears to say that the purpose of the laser pointer is to define which holes in the modular front plate would be left exposed to the flow of fluid, but does not mention that the laser pointer is used to target or direct the fluid jets at the grinding wheel. Webster’s description and figures provide no detailed structure for configuring or using the laser, and do not describe or suggest a nozzle body having a laser bore formed therein having a line of sight with the flow passage outlet, for insertion therein of the visible laser.

Furthermore, as provided in Applicant’s amended Claim 5, Webster does not disclose or suggest a removable plug that can be inserted into the laser bore after the laser is removed. These details can not be found to be inherent in Webster, nor can they be considered obvious in view of the disclosure of Webster.

E. Claims are rejected under 35 USC 103

The Examiner rejects Claims 1-4 and 6-8 under 35 USC 103(a) as being unpatentable over Kondo (6,386,948) in view of Webster, Kuykendal, Goldsmith et al, Klein et al., or Bramwell.

The Examiner notes that Kondo generally discloses a metal machining apparatus using a coolant nozzle, but does not disclose a laser for aligning the nozzle. More particularly, Kondo discloses a machining system wherein the temperature of the coolant fluid is controlled to optimize the operating life of a cutting blade.

Kuykendal discloses a water-cooled laser machine tool that simultaneously cuts with the laser and cools with water the workpiece being cut by the laser. The laser is the cutting element. There is not indication that the laser is used to help position the machining means, nor any mention of a machining tool that acts along a machining interface with a workpiece.

Goldsmith et al. discloses an illumination means that appears to be integral with (not removable from) the nozzle, to direct a pneumatic stream of an abrasive at a tooth. Goldsmith does not mention a coolant fluid, nor is the laser directed at a machining interface with a workpiece.

Klein, II et al. discloses a spray painting system that mounts a diode laser to the side of the spray gun. The diode laser emits a pair of beams that can be adjusted to converge at a particular distance from the laser. The diode laser is used to adjust the distance of the spray nozzle from the painted surface. The reference does not disclose or suggest a machining operation, or a coolant. There is no suggestion in Klein that the paint stream needs to be directed at a particular point; rather, it is more concerned with the spraying distance from the spray nozzle to the surface.

Bramwell discloses a light beam projecting device that uses a prism to split a light beam into two beams that are emitted from the device at a relative angle. The orientation of the two beams defines the orientation of the wide angle flat spray pattern of water that is sprayed into the direction of a roller. The light beam projecting device is attached to the spray nozzle. Bramwell does not mention machining of a workpiece, and makes no specific mention of the importance of directing the spray at the interface of the rollers(s) with the workpiece (the continuous strand S). Bramwell also does not direct the laser beam at the interface, and does not disclose a nozzle that configures the laser for insertion into the flow passage of the nozzle for proper alignment.

Applicants assert that the Examiner has failed to make out a proper prima facie case of obviousness. The Examiner can not point to any description in Kondo that discloses or suggests the importance or need for accurate or precise aiming of the fluid nozzle at the cutting blade. Consequently, it is not clear that a person of ordinary skill, in view of Kondo, would even consider the need or importance of accurate aiming, and particularly use of a laser beam.

Webster discloses machining a workpiece with a grinding wheel, but, as mentioned above, merely mentions some advantage of using a laser beam to select the pattern for the modular front plate, but does not disclose or suggests the aiming or targeting of the fluid jets. Applicants believe there is nothing in the Webster disclosure that would motivate a person of ordinary skill to combine the Webster reference with Kondo.

Furthermore, none of the remaining references (Kuykendal, Goldsmith, Klein, or Bramwell) mention machining a workpiece with a machining tool such as a grinding wheel, and using the nozzle to direct cooling liquid at the machining interface. Kuykendal uses the laser to cut the workpiece, not to target the machining tool. Goldsmith uses the light beam to direct a pneumatic stream of abrasive at a tooth. Klein uses the laser to select the proper distance of a paint spray nozzle from the painted surface. Bramwell uses two projected beams to orient a flat

spray pattern, but aims the two beams away from the interface of the rollers with the strand. Absent Applicant's own invention, there is no disclosure in any of these references to motivate a person of ordinary skill to combine the same with Kondo.

And, even if one were to combine Kondo with any one or more of the remaining references, for argument sake, one would not obtain Applicant's invention. Webster, Klein and Bramwell do not disclose placing the laser device within the flow channel that transports the stream of the coolant liquid. Kuykendal uses the coolant to cool the laser. Goldsmith uses no coolant liquid whatsoever.

In conclusion, the Examiner has failed to establish a prima facie case of obviousness, and in the alternative, none of the references alone or in combination disclose or suggest Applicants' claimed invention.

The Examiner's reliance on *In re Japikes* and *Nerwin v. Erlichman* does not relieve the Office of its burden of establishing a prima facie case of obviousness, or of showing that each element of the claimed invention is either disclosed or suggested in the reference. Absent the hindsight of Applicant's disclosure, the Examiner can not identify the specific disclosures within these references that a person of ordinary skill might choose to combine to achieve Applicants' claimed invention.

F. Publications Cited in Equivalent European Application

Applicants submitted a Supplemental IDS on April 1, 2005 for art cited in the corresponding European patent application 04256826.1, dated February 17, 2005.

1. U.S. Patent Application Publication 2003-0094515, published May 22, 2003, is equivalent to Webster, cited by the Examiner.
2. U.S. Patent Application Publication 2004-0134968, published July 15, 2004, (equivalent to WO020083360, published October 24, 2002), discloses a laser attachable to the outside of a rivoting or other affixment machine, to obliquely direct a laser beam at a reference position on a component to be affixed. The reference does not disclose or suggest a liquid coolant nozzle for directing coolant at a machined surface, or positioning of the laser within the flowpath of the coolant nozzle, or replacing the laser with a plug during the machine operation.

3. U.S. Patent 6,374,158, published April 16, 2003 (Fusaro), equivalent to EP Publication EP1125695, published August 22, 2001, discloses a laser positioned in a housing that is affixable to a robotic arm for calibrating the path and offset positioning of the robotic arm along a workpiece surface. A plasma spray gun nozzle can then be installed in place of the laser housing for directing a plasma toward the workpiece. The reference does not disclose or suggest using the laser for directing a liquid coolant from a coolant nozzle toward a machined surface, or positioning the laser within the flow path of the coolant nozzle, or replacing the laser with a plug during the machining operation.
4. The Abstract of JP Publication 07132444, published May 23, 1995, discloses a jig configured to fit removably onto the front of a fluid nozzle. The jig has a light emitter that directs light along the same axis as the fluid jet being emitted from the nozzle. The reference does not disclose or suggest providing a laser bore within the coolant nozzle in fluid communication with the flow passage, for insertion of the laser within the nozzle, or replacing the laser with a plug within the bore during the machining operation.

The Applicants request reconsideration of the rejections, in view of the claim amendments, and a prompt allowance.

Respectfully submitted,

By:



Daniel F. Nesbitt
Attorney for Applicants
Registration No. 33,746
(513) 229-0383
Customer Number 31838

Date: June 7, 2005